



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

March 9, 2000  
NOC-AE-00000781  
File No.: G26  
10CFR50.73  
STI: 31054598

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555-0001

South Texas Project  
Unit 2  
Docket No. STN 50-499  
Licensee Event Report 00-001  
Engineered Safety Feature Actuation Due to Anticipated  
Transient Without Scram Mitigation System Actuation Circuitry

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 2 Licensee Event Report 00-001 regarding an Engineered Safety Feature actuation Due to Anticipated Transient Without Scram Mitigation System Actuation Circuitry. This event did not have an adverse effect on the health and safety of the public.

Licensee commitments are listed in the Corrective Action section of the attachment. If there are any questions on this submittal, please contact either Mr. S. M. Head at (361) 972-7136 or me at (361) 972-7800.

A handwritten signature in black ink, appearing to read "G. L. Parkey".

G. L. Parkey  
Plant General Manager

MKJ

Attachment: LER 00-001 (South Texas, Unit 2)

IE22

cc:

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U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

# LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information

FACILITY NAME (1)

South Texas Unit 2

DOCKET NUMBER (2)

05000 499

PAGE (3)

1 of 3

TITLE (4)

Engineered Safety Feature Actuation Due to Anticipated Transient Without Scram Mitigation System Actuation Circuitry

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)																								
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER																							
02	09	2000	2000	001	0	03	09	2000		05000																							
<p>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</p> <table border="1"> <tr> <td>20.2201(b)</td> <td>20.2203(a)(2)(v)</td> <td>50.73(a)(2)(i)</td> <td>50.73(a)(2)(viii)</td> </tr> <tr> <td>20.2203(a)(1)</td> <td>20.2203(a)(3)(i)</td> <td>50.73(a)(2)(ii)</td> <td>50.73(a)(2)(x)</td> </tr> <tr> <td>20.2203(a)(2)(i)</td> <td>20.2203(a)(3)(ii)</td> <td>50.73(a)(2)(iii)</td> <td>73.71</td> </tr> <tr> <td>20.2203(a)(2)(ii)</td> <td>20.2203(a)(4)</td> <td>X 50.73(a)(2)(iv)</td> <td>OTHER</td> </tr> <tr> <td>20.2203(a)(2)(iii)</td> <td>50.36(c)(1)</td> <td>50.73(a)(2)(v)</td> <td rowspan="2">Specify in Abstract below or in NRC Form 366A</td> </tr> <tr> <td>20.2203(a)(2)(iv)</td> <td>50.36(c)(2)</td> <td>50.73(a)(2)(vii)</td> </tr> </table>											20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)	20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)	20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71	20.2203(a)(2)(ii)	20.2203(a)(4)	X 50.73(a)(2)(iv)	OTHER	20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A	20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)
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LICENSEE CONTACT FOR THIS LER (12)

NAME

Scott Head - Licensing Supervisor

TELEPHONE NUMBER (Include Area Code)

(361) 972-7136

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

YES  
(If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 2/9/00 at 1546, with the reactor at 32% power, Unit 2 experienced an Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC) actuation. AMSAC actuated in response to actual plant conditions, as opposed to equipment malfunction, spurious signal, or inappropriate actions by the operating crew. The plant conditions that caused the actuation were within normal bands for power ascension, indicating that reduced operating margin existed in the AMSAC design. AMSAC initiated in response to plant conditions causing a Turbine trip, Auxiliary Feedwater actuation, Steam Generator Blowdown and Sampling isolation. The Auxiliary Feedwater actuation started all the Auxiliary Feedwater pumps and began feeding all Steam Generators. The event was caused by a modification that introduced insufficient operating margin into the AMSAC design. The modification reduced the arming setpoint for turbine impulse pressure from 40% to 30%, and in doing so created a corresponding reduction in the operating margin. Corrective actions include verifying AMSAC and associated inputs (e.g. feedwater flow instruments) were operating as designed, and revising the modification process to ensure the impact on operating margin is properly addressed. In addition, procedures for Plant Shutdown and Plant Startup were revised to direct the bypassing of AMSAC once reactor power is reduced below 40% and prior to increasing above 38%.

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
South Texas, Unit 2	05000 499	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 3
		00	-- 001	-- 00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF EVENT

On 2/9/00 at 1546, with the reactor at 32% power, Unit 2 experienced an Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC) actuation. AMSAC actuated in response to actual plant conditions, as opposed to equipment malfunction, spurious signal, or inappropriate actions by the operating crew. There were no valid reactor trip signals and the reactor trip breakers appropriately remained closed. The plant conditions that caused the actuation were within normal bands for power ascension, indicating that reduced operating margin existed in the AMSAC design. AMSAC initiated in response to plant conditions causing a Turbine trip, Auxiliary Feedwater actuation, and Steam Generator Blowdown and Sampling isolation. The Auxiliary Feedwater actuation started all the Auxiliary Feedwater pumps and began feeding all Steam Generators.

AMSAC provides a backup means of protection against a loss of feedwater to the steam generators in the event that a reactor trip does not occur when warranted. The system is intended to provide protection at reactor power levels  $\geq 40\%$ , and will initiate a Main Turbine trip, Auxiliary Feedwater (AFW) actuation, Steam Generator Blowdown and Sampling System isolation. An AMSAC actuation will occur if all of the following conditions are met:

- 2 of 2 turbine first stage (impulse) pressure instruments indicate turbine load of greater than or equal to 30%; and,
- 3 of 4 feedwater flow signals less than 25% of the nominal 100% feed flow for greater than a predetermined time period based on impulse pressure.

During the performance of a Unit 2 startup on 2/9/00, the operating crew placed Steam Generator Feed Pump Turbine (SGFPT) #23 in operation to supply feedwater to the steam generators. At 1539, with reactor power at approximately 32%, the crew placed SGFPT #21 in service. When the speed of SGFPT #21 pump was increased and forward feeding was started, the two feed pumps began trying to share load. Minimum flow recirculation valves for each pump began to cycle open and shut trying to maintain flow. This is routinely experienced during plant startups and resulted in feed flow oscillations and slightly elevated steam generator levels.

At 1540, one of the two required turbine impulse pressure instruments reached its AMSAC arming setpoint of 30% as impulse pressure increased.

At 1541 the control room staff manually opened the recirculation valve for SGFPT #21 to provide an artificial load, allowing feedwater flow to the steam generators to stabilize. Feedwater flows were initially higher after the oscillations ceased, however, the main feed regulating valves responded to higher than program levels in the steam generators. Consequently, low flow trip signals to AMSAC did not reset. Once feed flow was stabilized, the power increase was recommenced and an increase in turbine load caused the second of the two required impulse pressure instruments to reach its AMSAC arming setpoint. At 1546, with AMSAC armed and 3 of 4 low feed flow signals present, an actuation initiated as designed causing a Turbine trip, Auxiliary Feedwater actuation, and Steam Generator Blowdown and Sampling isolation. The Auxiliary Feedwater actuation started all the Auxiliary Feedwater pumps and began feeding all Steam Generators.

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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

**CAUSE OF EVENT**

The event was caused by a modification that introduced reduced operating margin into the AMSAC design. The modification reduced the arming setpoint for turbine impulse pressure from 40% to 30%, and in doing so created a corresponding reduction in the operating margin. Consequently, a system intended to provide protection against abnormal deviations of reactor power and feedwater flow actuated under plant conditions that were normal for power ascension.

**ANALYSIS OF EVENT**

The actuations of the AMSAC and the Auxiliary Feedwater system (by AMSAC) were reported to the Nuclear Regulatory Commission as Engineered Safety Features Actuations, in accordance with 10CFR50.72(b)(2)(ii). No personnel injuries, radiological consequences, or equipment damage resulted from this event.

**CORRECTIVE ACTIONS**

The following corrective actions have been or will be taken as a result of this event:

1. AMSAC and associated inputs (e.g. feedwater flow instruments) were verified to be operating as designed.
2. Plant procedures have been revised to direct the bypassing of AMSAC once reactor power is reduced below 40% and prior to increasing above 38%.
3. The modification process will be revised to ensure the impact on operating margin is properly addressed. This action will be completed by June 1, 2000.

**ADDITIONAL INFORMATION**

There have been no other previous events reported by the South Texas Project to the Nuclear Regulatory Commission within the last three years similar to this occurrence.

An evaluation will be performed on pending/recently implemented modifications for impact on operating margin.